

PREVALENCE OF INTESTINAL PROTOZOA AND HELMINTHIC PARASITIC INFECTIONS IN ADULT POPULATION OF PUDUCHERRY

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ABSTRACT

An increasing of intestinal parasitic infections occurs in India is due to the improper sanitation and lack of water purity. Our main objective of the study is to determine the prevalence of intestinal parasites among clinically suspected patients who are attending our tertiary care teaching hospital. Totally 571 stool samples were collected from the patients who had a suspicion of parasitic infections and they sent to the Parasitology laboratory for routine diagnostic testing in Microscopy. Most of our patients are from rural and urban areas. The overall prevalence of intestinal parasites was found in this study is about 44 (7.70%) which includes *E. histolytica/dispar*, *Giardia*, *Hookworm*, *Blasotocystis* and *Strongyloides*. Remaining 527 stool samples were negative for protozoa, helminths and coccidian parasites. No statistical significance was observed between rural and urban patients. Helminthic infections are more endemic in this Union territory and surrounding Tamil Nadu when compared to the other parasitic infections. Urban populations are mostly affected due to unaware of the cleanliness program.

KEYWORDS: *E. histolytica*, *Hookworm*, Adult Population, Intestinal Infections & Wet Mount

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INTRODUCTION

In India, one third of the populations were mostly affected by the intestinal parasites viz., *Entamoeba histolytica*, *Entamoeba dispar*, *Ascaris*, *Trichuris trichiura*, and Hook worm (Kang *et al.* 1988:6). Increasing burden of helminthic infection in India due to the unhygienic personnel, overcrowding and water scarcity. Infection may pose major health problem among humans and induces severity of the disease (Bartelt *et al.*, 2013:1). In the late 19th century, the true prevalence of pathogenic intestinal parasites was recorded among South Indian population (Kang *et al.* 1998:6). Prevalence of intestinal parasitic infections in different states which ranges from 5.56% to 90% and most of them were found high in rural areas than the urban (Mathuria *et al.*, 2017:4; Mareeswaran *et al.*, 2018:5). Parasitic infection almost exists in every state of India in which it has been documented by several studies (Rituparna, *et al.* 2017:5; Shobha, *et al.* 2013:8; Manochitra, *et al.* 2016:8; Praharaj, *et al.* 2017:10; Kotian, *et al.* 2014:5; Ragunathan L, *et al.* 2010:5; Rashid, *et al.* 2011:3; Davane, *et al.* 2012:3; Kaur, *et al.* 2002:5; Patel, *et al.* 2014:3; Seghal, *et al.* 2010:4; Kumar, *et al.* 2014:7; Saurabh, *et al.* 2017:4). Clinical symptoms of these pathogenic parasites causes with severe abdominal as well as extra-abdominal infections like amoebic liver abscess

and acute amoebic colitis (Kotian *et al.*, 2014:4). These diseases can be preliminarily diagnosed by microscopy using saline, iodine wet mount and formol-ether concentration (Kumar, *et al.* 2014:7; Manochitra, *et al.* 2016:8). Development of techniques like Enzyme Linked Immunosorbent Assay (ELISA) and the molecular Polymerase Chain Reaction (PCR) for identification of parasitic antigens as well as antibodies in patients stool samples (Saurabh, *et al.*, 2017:4). Microscopy is a convenient and gold standard for diagnosis of intestinal parasitic infections when compared to the other methods like ELISA and PCR (Seghal *et al.*, 2010:4). Major disadvantages may show a lack of efficient vaccines (Kotian *et al.*, 2014:4). Helminths and Protozoal parasites such as *Ascaris lumbricoides*, hookworm, *Enterobius vermicularis*, *Entamoeba histolytica* and *Giardia lamblia* are commonly found in the intestines of humans, which yielded high morbidity mostly in child population (Kaur *et al.* 2002:5). Our main objective of the study is to determine the prevalence of intestinal parasites among clinically suspected patients who are attending our tertiary care teaching hospital.

MATERIALS & METHODS

This prospective and laboratory investigative study was carried out in the Department of Microbiology, Mahatma Gandhi Medical College and Research Institute, Puducherry. This study was conducted during the period of January 2018-January 2019. Totally 571 stool samples were collected from the patients who had suspicion of parasitic infections and they sent to the Parasitology laboratory for routine diagnostic testing like saline and iodine wet mount followed by formal ether concentration technique. Patients who are attending our hospital are from rural and urban areas.

Inclusion Criteria: patients with diarrhoea and other gastrointestinal tract infections like nausea, vomiting etc.

Exclusion Criteria: Improperly labelled samples, Samples with incomplete requisition forms and previously treated with antihelminthic drugs.

Processing of Stool Samples

Patients was educated to collect the samples in clean, wide, leak proof labelled containers provided by the laboratory with pinch of stool sample and asked the patients to avoid to full fill the containers till the rim. After collecting the samples, they were screened with Microscopic examination of Lugol's iodine and saline wet mounts for the presence of ova, larvae and cysts of parasites. Formal-Ether concentration technique will be performed for cases which had high clinical suspicion but were negative by the above mentioned tests. Modified acid fast staining will then be performed for all the samples for detection of intestinal coccidian parasites on methanol fixed stool smears.

STATISTICAL ANALYSIS

Percentages were calculated for Categorical variables. Mean and Standard deviation with 95% confidence interval was calculated for the patients' age. The fisher's exact test will be used to determine the statistical significance between rural and urban patients who had positive for intestinal parasitic infections.

RESULTS

Mean age of the patients was 47.4 and SD value is 17.51 with 95% confidence interval 47.40 ± 5.17 . Overall prevalence of intestinal parasites was found in this study is about 44 (7.70%) which includes

E. histolytica/dispar, *Giardia*, Hookworm, *Blasotocystis* and *Strongyloides*. Remaining 527 stool samples were negative for protozoa, helminths and coccidian parasites. Helminthic infections are prevalent in this Union territory and

surrounding Tamil Nadu when compared to the other parasitic infections. None of them were positive for coccidian parasites. Statistical analysis was performed showed no statistical significance between rural and urban patients who were positive for intestinal parasites (Table 1).

Table 1: Analysis of Intestinal Parasitic Positive between Rural and Urban Patients (n=44)

Category	Rural Patients (n=9)	Urban Patients (n=35)	P value* (Fisher's Exact Test)
Male	3	17	0.4771
Female	6	18	0.4771
<i>E. histolytica/dispar</i>	1	5	1.0000
<i>G. intestinalis</i>	0	2	1.0000
Hookworm	8	26	0.6585
Blastocystis	0	1	1.0000
Strongyloides larvae	0	2	1.0000

* $p \leq 0.05$ is considered to be statistically significant

DISCUSSIONS

An intestinal parasitic infection is one of the under estimated disease in the Asian countries. School children are facing a major problem with the parasitic infection due to the lack of hygienic and proper sanitation (Kotian S, *et al.* 2014:4). But in the present study we analysed only the adult population from the age of 18 to 89 years and found that age between 30-50 years were highly infected with intestinal parasitic infections. A higher prevalence of parasitic infections was found in school children (42.8%) and pregnant women (35.63%) on Chandigarh (Sehgal *et al.*, 2010:4). Recently, a similar study was recorded the prevalence of intestinal parasitic infections in Jodhpur population with moderate positivity of 16.3% (Saurabh K, *et al.* 2017:4). But in this study a low prevalence of 7.70% was observed among adult population in Puducherry and surrounding Tamil Nadu. Another study was conducted in CMC Vellore, the prevalence of intestinal parasites were documented 13% was seen in 6-10 years of age (Prahara I, *et al.* 2017:10). In the region of Burkino Faso found higher risks of *G. intestinalis* and *S. haematobium* among school children (Erismanin *et al.*, 2016:1). The occurrence of intestinal parasitic infections was varied among different states of India. Intestinal protozoa like *E. histolytica/dispar* are more prevalent in Jodhpur (Saurabh K, *et al.* 2017:4), Chandigarh (Sehgal R, *et al.* 2010:4), Bihar (Rituparna B, *et al.* 2017:5) and Puducherry (Manochitra K, *et al.* 2016:8). But low prevalent in Uttarkhand (Kotian S, *et al.* 2014:4) and New Delhi (Kaur R, *et al.* 2002:5). But in the contrast, the present study shows hookworm infections are more prevalent in the region of Puducherry and neighbouring Tamil Nadu state. Primarily an retrospective study was carried out in Puducherry with overall positivity is about 22.21% (Manochitra K, *et al.* 2016:8) but in our study projected a low prevalence 7.70% when compared to the above study. Coccidian parasites are absent in our stool samples. According to Kotian *et al.*, *G. lamblia* and *Hymenolepis nana* were the most common parasites found in the targeted population. There was increase of intestinal parasitic infections among rural than urban population in two health centres of Anakaputhur and Padappai of Kancheepuram district (Mareeswaran *et al.*, 2018:5). But in contrast, the present study shows that urban patients were mostly affected than the rural patients.

CONCLUSIONS

Microscopy is highly helpful and cost effective for diagnosing intestinal parasitic infections from stool samples. The study which mainly focuses on adult population of Puducherry and yielded that the urban populations are mostly infected with intestinal parasites. This may be due to improper hygienic conditions and large number of populations in a

particular area. Based on this study, we intend to create awareness among rural population regarding the cleanliness of an individual and how they should implement the same in the society.

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